

## INITIAL ASSESSMENT ILLINOIS RIVER BASIN RESTORATION

### Section 519 of the Water Resources Development Act (WRDA) of 2000

**1. STUDY AUTHORITY.** The Illinois River Basin Restoration project is being initiated under the Corps of Engineers General Investigation Program. This Initial Assessment was initiated pursuant to the provision of funds in the Energy and Water Development Appropriations Act of 2002. The project, authorized under Section 519 of WRDA 2000, includes a Comprehensive Plan and Critical Restoration Project components.

#### ***Comprehensive Plan***

*The Secretary shall develop, as expeditiously as practicable, a proposed Comprehensive Plan for the purpose of restoring, preserving, and protecting the Illinois River Basin...The Comprehensive Plan shall provide for the development of new technologies and innovative approaches to: (1) enhance the Illinois River as a vital transportation corridor; (2) improve water quality within the entire Illinois River Basin; (3) restore, enhance, and preserve habitat for plants and wildlife; (4) increase economic opportunity for agriculture and business communities...The Comprehensive Plan shall include such features as are necessary to provide for: (1) the development and implementation of a program for sediment removal technology, sediment characterization, sediment transport, and beneficial uses for sediment; (2) the development and implementation of a program for the planning, conservation, evaluation and rehabilitation, and stabilization and enhancement of land and water resources in the basin; (3) the development and implementation of a long-term resource monitoring program; (4) the development and implementation of a computerized inventory and analysis system.*

#### ***Critical Restoration Projects***

*If the Secretary, in cooperation with appropriate Federal agencies and the State of Illinois, determines that a restoration project for the Illinois River Basin will produce independent, immediate and substantial restoration, preservation, and protection benefits, the Secretary shall proceed expeditiously with the implementation of the project.*

**2. STUDY PURPOSE.** Section 519 of WRDA 2000 authorizes both completion of a Comprehensive Plan for the basin and the identification, evaluation, and selection of Critical Restoration Projects. The purposes of this Initial Assessment are to: (1) identify watershed needs and present a framework to develop and implement a Comprehensive Plan, including long-term resource monitoring and (2) identify procedures and responsibilities for the identification and evaluation of Critical Restoration Projects. A Project Management Plan and Cost Sharing Agreement with a non-Federal sponsor will be negotiated upon completion of the Initial Assessment.

### **3. LOCATION OF STUDY AREA.**

a. Section 519 of WRDA 2000 defines the Illinois River Basin as the Illinois River, Illinois, its backwaters, its side channels, and all tributaries, including their watersheds, draining into the Illinois River.

b. Most Congressional Districts within Illinois are located at least partially within the Illinois River Basin. They are: Rush IL-1, Jackson IL-2, Lipinski IL-3, Gutierrez IL-4, Blagojevich IL-5, Hyde IL-6, Davis IL-7, Crane IL-8, Schakowsky IL-9, Kirk IL-10, Weller IL-11, Biggert IL-13, Hastert IL-14, Johnson IL-15, Manzullo IL-16, Evans IL-17, La Hood IL-18, Phelps IL-19, and Shimkus IL-20.

**4. PRIOR STUDIES AND REPORTS.** A number of documents were reviewed, including documents prepared by the U.S. Army Corps of Engineers, the Illinois Department of Natural Resources, the Illinois State Water Survey, the Illinois Natural History Survey, the Tri-County Regional Planning Commission, the University of Illinois, The Nature Conservancy, the Heartland Water Resources Council, and the Office of the Lt. Governor of the State of Illinois. Some of the most notable studies and actions are as follows:

a. The Fate of Lakes in the Illinois River Valley, Bellrose, Frank C., et al. Illinois Natural History Survey, 1983. This document reports historical sedimentation rates for Illinois River backwater lakes. The analysis served to develop mathematical models to predict the life expectancy of Illinois River backwater lakes. Most backwaters have filled dramatically with sediment at an average annual rate of 0.10 to 0.74 inches since the locks and dams were constructed in the 1930's. System-wide, backwater lakes have lost an average of 70 percent of their volume since 1903.

b. Sediment Yield of Streams in Northern and Central Illinois, Adams, J. Roger, et al., Illinois State Water Survey, December 1984. This report develops mathematical models to estimate sediment yields for streams in the Illinois River Basin based on sediment monitoring data.

c. Peoria Lake Sediment Investigation, prepared for the U.S. Army Corps of Engineers by the Illinois Department of Energy and Natural Resources, State Water Survey Division, January 1986. This report summarizes the impacts of human activities on sedimentation using data from bathymetric profiles and the core samples. Controlling sedimentation in Peoria Lake would require some combination of controlling sediment input, managing in-lake sediment, drawing down Peoria Lake, creating artificial islands, selective dredging, and creating marshy areas.

d. Illinois River from Henry to Naples, Illinois, Peoria Lake and La Grange Pool, Illinois River Basin, U.S. Army Corps of Engineers Reconnaissance Study, March 1987. This study, authorized in Section 109 of Section 1304 of the Supplemental Appropriations Act, investigates the advisability of the preservation, enhancement, and rehabilitation of Peoria Lake near Peoria, Illinois.

e. Hydraulic Investigation for the Construction of Artificial Islands in Peoria Lake, Illinois Department of Energy and Natural Resources, State Water Survey Division, Champaign, Illinois, July 1988. This investigation identifies the best location for building islands in Upper and Lower Peoria Lakes. Hydraulic modeling was used to determine the effects of islands upon water surface elevations, sedimentation patterns, and current velocities.

f. Upper Mississippi River System-Environmental Management Program, Peoria Lake Habitat Rehabilitation and Enhancement Project Definite Project Report, U.S. Army Corps of Engineers, July 1990. This technical publication, complete with National Environmental Policy Act documentation and engineering plans, was the authorizing document by which a 16-acre barrier island was created in Upper Peoria Lake. This project enhanced migratory waterfowl, fish, and aquatic habitat. Project monitoring indicates that there has been an increase in absolute numbers and diversity of water bird and fish species at the project site.

- g. The Illinois River: Working for Our State, Talkington, Laurie McCarthy, Illinois State Water Survey, January 1991. This document describes the past, current, and projected future conditions of the Illinois River.
- h. Erosion and Sedimentation in the Illinois River Basin, Demissie, Misganaw, et al., Illinois State Water Survey, June 1992. This report provides an estimated sediment budget for the Illinois River Valley. The report also discusses the effect of changed crop practices upon sediment loads.
- i. Source Monitoring and Evaluation of Sediment Inputs for Peoria Lake, Bhowmik, Nani G., et al., Illinois State Water Survey, February 1993. The objectives of this study were to identify the sediment sources to Peoria Lake and to evaluate sediment loads from local tributaries. This study evaluated the sources of sediment in Peoria Lake and estimated that a large percentage of sediment in the lake comes from local tributaries.
- j. Section 216 Initial Appraisal, Illinois Waterway System Ecosystem Restoration and Sedimentation, Illinois, U.S. Army Corps of Engineers, Rock Island District, August 1996. This document recommends further study of the Illinois Waterway ecosystem in light of changed physical and economic conditions since the 9-foot navigation channel was constructed.
- k. Illinois River Characterization for Restoration and Beneficial Use of Sediment, Marlin, John C., Illinois Department of Natural Resources Waste Management and Research Center, April 1997. Proposal to U.S. Department of Agriculture.
- l. Strategic Renewal of Large Floodplain Rivers, University of Illinois, Water Resources Center. This ongoing research effort at the University of Illinois, Urbana, Illinois, aims to develop a combined hydrologic and economic restoration model for the La Grange Pool of the Illinois River.
- m. Restoration of Large River Ecosystems: Hydrologic and Hydraulic Analyses of La Grange Pool of the Illinois River, Xia, R. and M. Demissie, 1997. Hydrology Division, Illinois State Water Survey, Champaign. This report documents the hydrologic and hydraulic analysis of the La Grange Pool conducted for the Strategic Renewal of Large Floodplain Rivers research effort.
- n. Integrated Management Plan for the Illinois River Watershed, January 1997. This plan was prepared by the Illinois River Strategy Team in cooperation with nearly 150 participants, chaired by Lt. Governor Bob Kustra. The plan contains 34 recommendations divided into six sections: In the Corridor, Soil and Water Movement, Agricultural Practices, Economic Development, Local Action, and Education.
- o. Mackinaw River Watershed Management Plan, The Nature Conservancy, June 1998. This document provides a long-range plan for the 1,138-square-mile watershed of this tributary of the Illinois River that recommends the establishment or restoration of 22,500 acres of wetlands.
- p. Illinois River Site Conservation Plan, The Nature Conservancy, December 1998. This document presents a plan for the implementation of conservation measures in the Illinois River Basin.
- q. The Classification of Aquatic Communities in the Illinois River Watershed and Their Use in Conservation Planning, The Nature Conservancy, December 1998.
- r. Threats to the Illinois River Ecosystem, The Nature Conservancy, December 1998. The document summarizes the results of the threat assessment, which concludes that altered hydrology, habitat loss, sedimentation, and altered water quality are the four most critical stresses to the system.

s. Unified Watershed Assessment and Watershed Restoration Priorities for Illinois, Watershed Management Committee, 1998. This report and the associated action plan list priority watersheds in the State of Illinois and call for coordination of activities and resources to help protect and/or restore water resources. The Illinois River Watershed and many of its tributary watersheds are listed as priority watersheds.

t. General Investigation Reconnaissance Study, Illinois River, Peoria Riverfront Development (Environmental/Ecosystem Restoration), U.S. Army Corps of Engineers, Rock Island District, May 1998. This study determined the Federal interest in: (1) reducing sedimentation impacts in the Illinois River at Peoria Lake, (2) restoring fish and wildlife habitat, and/or (3) providing flood damage reduction measures as related to riverfront development near Peoria. This reconnaissance effort led to the feasibility study described below.

u. General Investigations Reconnaissance Study, Illinois River Ecosystem Restoration, Section 905(b) Reconnaissance Analysis, U.S. Army Corps of Engineers, Rock Island District, January 1999. This report concluded that ecosystem restoration in the Illinois River Basin is within the Federal interest and that Corps of Engineers involvement is appropriate. Further, measures to address the loss of backwaters, changed hydrologic regimes and water fluctuations, and other impacts upon the system were identified and found to have no anticipated negative environmental impacts. The resulting Project Study Plan and Cost Sharing Agreements with the Illinois Department of Natural Resources have resulted in the initiation of the Illinois River Ecosystem Restoration Feasibility Study, a description of which follows in Section 5 of this report.

v. General Investigation Feasibility Study, Illinois River, Peoria Riverfront Development (Environmental/Ecosystem Restoration), U.S. Army Corps of Engineers, Rock Island District. The Peoria Riverfront Development (Ecosystem Restoration) Project Feasibility Study is being conducted by the Corps of Engineers and Illinois Department of Natural Resources (non-Federal sponsor) to investigate the Federal and State interest in ecosystem restoration within Peoria Lake and the Farm Creek Watershed. Recommendations regarding dredging with island creation and tributary restoration are anticipated. The study is nearing completion, and a draft report is scheduled for release in May 2002.

**5. SIGNIFICANT ONGOING ACTIONS.** The Illinois River Basin has long been an important environmental and economic resource. This importance led Congress to recognize the Illinois River as part of the Upper Mississippi River System as a unique nationally significant ecosystem and a nationally significant commercial navigation system in Section 1103 of WRDA 1986. The National Research Council recognizes the Illinois River as a nationally significant floodplain river with excellent prospects for restoration.

The State of Illinois also recognizes the important resource that the Illinois River Basin represents. The Offices of the Governor and Lt. Governor have led efforts to focus attention on the Illinois River, including completing an *Integrated Management Plan for the Illinois River Watershed* and proposing “Illinois Rivers 2020”—a \$2.5 billion, 20-year State and Federal initiative to restore the Illinois River. Local groups within the river basin have been active in pursuing restoration. The State of Illinois has committed itself to restoration activities in the basin by leading planning efforts and enacting legislation aimed at basin restoration. The State has supported restoration efforts through the most successful Conservation Reserve Enhancement Program in the Nation and numerous locally led watershed planning initiatives. In addition, local groups strongly support and have been active in pursuing restoration in the basin.

Several ongoing activities involve collaborative efforts among Federal, State, and local agencies to address water and related land resources within the Illinois River Basin. The most significant actions include the following efforts:

a. U.S. Army Corps of Engineers Efforts.

(1) Illinois River Ecosystem Restoration Feasibility Study. The Illinois River Ecosystem Restoration Feasibility Study is a 3-1/2 year, \$5.24-million effort being conducted under the authority of Section 216 of the Flood Control Act of 1970 in partnership with the State of Illinois, Department of Natural Resources.

The study will identify the Federal and State interest in addressing problems within the entire Illinois River Watershed as shown on the project map (Enclosure 1). System problems and a draft set of goals and objectives have been developed through numerous meetings with agency representatives, local sponsors, and other stakeholders. The principal habitat problems in the Illinois River Basin are the result of sedimentation of backwaters and side channels, degradation of tributary streams, water level fluctuations, loss of floodplain and tributary connectivity, and other adverse impacts caused by human activities. Two efforts currently underway in the study are: (1) a system evaluation focused on assessing overall watershed needs and general locations for restoration, and (2) identification and assessment of site-specific projects.

A major focus of the system assessment is a Restoration Needs Assessment (RNA). The RNA will evaluate the need for restoration in the entire basin, with a focus on the tributaries and sub-watersheds feeding into the mainstem of the Illinois River. It will provide a practical and scientific basis for assessing the large study area and identifying potential restoration project types and locations for the Illinois River and its tributaries. The RNA will also define the critical data gaps hindering the ability to determine habitat needs and focus the study, planning, and construction efforts on the areas of critical need. The RNA will provide a comprehensive, basin-wide assessment of historic ecological change, existing conditions, predicted future conditions, and desired future conditions. Using selection criteria and a formulation framework developed as part of the feasibility study, the final report may recommend a multi-year program to address a larger list of projects.

A number of efforts to develop detailed project plans for specific sites are underway. At the request of the State, the Corps of Engineers has initiated assessments for six site-specific projects in the basin, as follows:

(a) Waubonsie Creek. Waubonsie Creek is located in northeastern Illinois. The creek has a number of low-head dams that prevent movement of fish from the Fox River into potential spawning and nursery habitat in Waubonsie Creek. Restoration alternatives include dam removal or modifications to provide fish passage and restoration of instream and riparian habitats.

(b) Pekin Lake. Pekin Lake is a backwater lake complex located adjacent to the Illinois River at River Miles (RM) 153-156 of the Illinois Waterway. Sedimentation has reduced the depth of the backwater lake complex and has degraded the natural aquatic resources. Restoration alternatives include dredging to maintain and improve aquatic habitats and managing water levels to ensure the presence of moist soil plants for use by waterfowl.

(c) Iroquois River. The Iroquois River is located in eastern Illinois and western Indiana. Modifications of tributaries through ditching and straightening have increased velocities, bed and bank erosion, and the sediment load delivered to the Iroquois River and eventually the Illinois River. Restoration efforts will focus on streambed and bank stabilization and riparian corridor restoration.

(d) McKee Creek. McKee Creek is located in west-central Illinois. This stream displays severe streambank and streambed erosion and is contributing sediment directly to the Lower Illinois River. Restoration efforts will focus on stabilizing a head cut at the lower portion of McKee Creek to keep stream downcutting, widening, and bank collapse from progressing upstream through the watershed.

(e) Blackberry Creek. Blackberry Creek is located in northeastern Illinois. Currently, the stream has high quality habitats, but a 10-foot dam near the confluence with the Fox River severely limits fish and macroinvertebrate access to this habitat. Restoration alternatives include removal of the dam or construction of a fish passage structure.

(f) Kankakee River-Mainstem. The Kankakee River is located in northeastern Illinois and northwestern Indiana. The Kankakee River carries an excessive sediment load, and habitat quality in the Kankakee River is expected to decline due to sedimentation. Side channel and pool areas in this reach are expected to continue to lose depth and habitat diversity as cobble and gravel substrates become covered by sand. Restoration alternatives include removing excess sediment to prevent further aquatic habitat degradation and restoring riffle, pool, and side channel habitats.

(2) Peoria Riverfront Development (Ecosystem Restoration) Study, Illinois. The Peoria Riverfront Development (Ecosystem Restoration) project is located within Peoria and Tazewell Counties, Illinois, between Illinois River Miles 162-167. The feasibility study is being conducted by the Corps of Engineers and Illinois Department of Natural Resources (non-Federal sponsor) to investigate Federal and State interest in ecosystem restoration within Peoria Lake and the Farm Creek Watershed. Its principal goal is to enhance aquatic habitats through the restoration of depth diversity and to reduce sediment delivery and deposition; ancillary benefits are expected for recreational boating and fishing. Draft recommendations include dredging with island creation and tributary restoration. Specific authority for conducting the Peoria Riverfront Development Study is contained in Resolution 2500 of the Committee on Transportation and Infrastructure, adopted May 9, 1996. A final report is scheduled for May 2002.

(3) Upper Mississippi River System-Environmental Management Program. The Environmental Management Program for the Upper Mississippi River System was established by the Water Resources Development Act of 1986. Currently, the Environmental Management Program is comprised of two elements—Habitat Rehabilitation and Enhancement Projects (HREPs) and the Long Term Resource Monitoring Program (LTRMP). This ongoing system program provides a combination of monitoring and habitat restoration activities.

The HREPs employ a variety of techniques in various combinations to address the unique circumstances of a particular area in order to protect, preserve, and enhance fish and wildlife habitat in the Upper Mississippi River System. As of January 2002, 73 HREPs are in various stages of planning, design, construction, and post-construction evaluation, and over 33 HREPs have been completed. Project planning, engineering, construction, and monitoring approaches applied to HREPs have evolved with the program and have resulted in improved efficiency, productivity, and responsiveness.

The LTRMP provides resource managers and decision makers with information necessary for maintaining the Upper Mississippi River System as a sustainable multiple-use large river ecosystem. The goals of the LTRMP include: (1) developing a better understanding of the ecology of the Upper Mississippi River System and its resource problems; (2) monitoring resource changes; (3) developing alternatives to better manage the Upper Mississippi River System; and (4) providing for the proper management of LTRMP information.

(4) *Upper Mississippi River-Illinois Waterway System Navigation Study*. The study addresses the need for navigation improvements on the Upper Mississippi River and the Illinois Waterway System. The study area includes 854 miles of the Upper Mississippi River, with 29 locks and dams, between Minneapolis-St. Paul and the mouth of the Ohio River, and 348 miles of the Illinois Waterway, with 8 locks and dams. The study area lies within portions of Illinois, Iowa, Minnesota, Missouri, and Wisconsin. The navigation system's principal problem is delays to commercial traffic due to limited lockage capacity and increasing traffic. Several locks in the study area have some of the highest average commercial tow delays in the country. These delays continue to increase with traffic growth.

The feasibility phase of the study began on April 16, 1993, and in light of recommendations from the National Research Council (NRC) and based on input from a Federal agency task force, the study was refocused in August 2001 to concentrate on environmentally sustainable development of the river system. A Comprehensive Plan for the Upper Mississippi River and Illinois Waterway System will be developed in phases to recommend environmentally sustainable development for navigation, as well as recommendations for ecosystem restoration and improvements. An interim report will be completed in the summer of 2002 and will contain the scope of the comprehensive river management plan with recommendations for continued navigation planning.

(5) *Kankakee River Basin Ecosystem Restoration Feasibility Study*. The Kankakee River Basin extends for 200 miles and covers more than 5,200 square miles in Illinois and Indiana. Recurrent flooding causes damages to agriculture and infrastructure. The U.S. Army Corps of Engineers, Chicago District, study is investigating the flooding problem and may recommend flood protection, sediment control, and/or ecosystem restoration measures using traditional methods, such as levees and sand removal and ecosystem enhancement, restoration and preservation features such as opening old river meanders, wetland creation, and erosion barriers. The non-Federal project sponsors are the Indiana and Illinois Departments of Natural Resources and the Kankakee River Basin Commission. The feasibility study is cost shared equally between the Federal Government and the Illinois Department of Natural Resources (non-Federal sponsor).

b. Other Ongoing Federal Efforts.

U.S. Department of Agriculture (USDA) Programs. Several USDA programs provide funding to agricultural producers in support of environmental objectives, generally administered through local Natural Resources Conservation Service (NRCS) field offices. The Environmental Quality Incentives Program (EQIP) provides technical, financial, and educational assistance to farmers and private landowners who are faced with serious threats to soil, water, and related natural resources. Working with approximately 2,400 landowners within the Illinois River Basin, the EQIP program has expended approximately \$2.9 million for financial and educational assistance to treat natural resources concerns on approximately 250,000 acres. The Wildlife Habitat Incentive Program (WHIP) has provided approximately \$250,000 of assistance to develop and improve wildlife habitat on private lands within the Illinois River Basin.

The Wetland Reserve Program (WRP) increases wildlife habitat and improves water quality by providing additional wetland habitat, slowing overland flow, and providing natural pollution control. To date, approximately \$3.4 million has been spent in the Illinois River Basin to restore 2,300 acres of habitat on 13 properties. Also, the Conservation Reserve Program (CRP) enrollments beyond the Conservation Reserve Enhancement Program (CREP) enrollments provide additional in-place conservation practices facilitating resource management in the Illinois River Basin. Finally, the Forestry Incentives Program provides an avenue of assistance to private landowners for planting trees, improving timber stands, as well as other non-industrial private forest land practices.

In April 1997, the USDA officially launched the National Conservation Buffer Initiative and pledged to help landowners install 2 million miles of conservation buffers by the year 2002. The initiative is led by the NRCS in cooperation with the Agricultural Research Service, Farm Service Agency; Forest Service; Cooperative State Research, Education, and Extension Service; State conservation agencies; conservation districts; and numerous other public and private partners. The National Conservation Buffer Initiative encourages farmers and ranchers to understand the economic and environmental benefits of buffer strips and use these practices through the various programs of the conservation tool kit. Programs used for this effort include the continuous CRP sign-up, as well as the EQIP, WHIP, WRP, Stewardship Incentives Program, and Emergency Watershed Protection Program.

c. Ongoing Efforts by the State of Illinois.

(1) State of Illinois Natural Resources Coordinating Council (NRCC). In 1994, the State formed the NRCC, which consists of the directors of eight Illinois State agencies, to address and coordinate issues between the State's natural resource and environmental agencies. The NRCC has created the Watershed Management Committee (WMC) and has charged the Committee with the following mission:

*To serve in an ongoing capacity to coordinate watershed-based activities and programs among the State's natural resource and environmental agencies. The Committee will also serve a liaison function to provide for the coordination of Federal and local involvement in watershed activities. An overall strategy will be developed that will include specific recommendations by the Committee, and review and endorsement by the Natural Resources Coordinating Council.*

In 1998, the WMC was expanded to include additional State and Federal agencies, as well as several non-governmental organizations in order to both expedite the development of watershed approaches for resource planning and to promote greater coordination between State agencies and Federal counterparts. In an effort to restore and protect watersheds within the state, the WMC published *Unified Watershed Assessment and Watershed Restoration Priorities for Illinois*. This report and the associated action plan lists priority watersheds in the State of Illinois and calls for coordination of activities and resources to help protect and restore water resources. The Illinois River Watershed and many of its tributary watersheds are listed as priority watersheds.

(2) Conservation Reserve Enhancement Program (CREP). More than \$400 million has been targeted to improve the Illinois River through the CREP, which uses state funding to enhance existing USDA Conservation Reserve Program (CRP) activities. The CREP initiative will help preserve up to 132,000 acres of sensitive land surrounding the Illinois River and its tributaries, including upland areas. As of January 4, 2002, 98,352 acres was enrolled within the Illinois River Basin, and a further 29,011 acres of land was pending contract signing.

(3) Illinois River Watershed Restoration Act. In July 1997, the State of Illinois enacted the Illinois River Watershed Restoration Act. The legislative purposes of the Act are to: (1) create a group of leaders representing agriculture, business, conservation, and the environment to encourage the implementation of efforts to restore the Illinois River Watershed in accordance with the recommendations of the *Integrated Management Plan for the Illinois River Watershed Technical Report*, (2) work with local communities to develop projects and regional strategies, and (3) make recommendations to appropriate State and Federal agencies.

(4) Illinois Department of Natural Resources-Conservation 2000 Ecosystems Program. In 1995, the State initiated and funded a \$100 million Conservation 2000 (C2000) Program to protect and



manage Illinois' natural resources. The program is authorized through the year 2009 and is subject to annual appropriations. The nine programs funded under C2000 are administered by three State agencies—Illinois Department of Natural Resources, Illinois Department of Agriculture, and Illinois Environmental Protection Agency.

The largest C2000 Program administered by the Illinois Department of Natural Resources is the Ecosystems Program. The Ecosystems Program provides financial and technical support for maintaining, restoring, and enhancing ecological and economic conditions in key watersheds throughout the Illinois River Watershed and the rest of the state. The C2000 Program is delivered through ecosystem partnerships, which are coalitions of local stakeholders who develop and implement natural resources plans that include a broad array of projects for restoration, protection, enhancement, monitoring, and education. The partnerships apply for competitive grants and have been awarded funding for projects that are directly related to Illinois River Restoration. As of 2001, the value of all C2000 Ecosystem Projects totaled \$43,487,865. The C2000 Program contribution was \$16,583,458, with matching funds of \$26,904,408. These projects provide for streambank stabilization, wetland restoration, prairie restoration, riparian buffers, vegetative covers on construction sites, and restoration of oxbows in tributaries of the Illinois River.

(5) *Illinois Department of Agriculture.* Through September 30, 2000, the C2000 Program has funded \$2,160,213 worth of upland soil and water conservation practices in the 53 counties that comprise the Illinois River Watershed. Administered by the Department and County Soil and Water Conservation Districts (SWCDs), this program provides 60 percent of the cost of constructing conservation practices that reduce soil erosion and protect water quality. Eligible conservation practices include terraces, grassed waterways, water and sediment control basins, and grade stabilization structures. Between July 1999 and September 2000, approximately 900 individual conservation projects were completed in the Illinois River Watershed, bringing soil loss to tolerable levels on over 48,810 acres of land. This translates into over 235,000 fewer tons of soil loss each year.

In FY 2000, the State of Illinois, through the Department of Agriculture, provided over \$3.6 million to 51 county SWCD offices in the Illinois River Watershed. Funds were used to provide financial support for SWCD offices, programs, and employees' salaries. Employees, in turn, provided technical and educational assistance to both urban and rural residents of the Illinois River Watershed. Their efforts are instrumental in delivering programs that reduce soil erosion and sedimentation and protect water quality.

In an effort to stabilize and restore severely eroding streambanks that would otherwise contribute sediment to the Illinois River and its tributaries, the Department of Agriculture is administering the Streambank Stabilization and Restoration Program (SSRP). The SSRP, funded under C2000, provides funds to construct low-cost vegetative or bio-engineered techniques to stabilize eroding streambanks. In Fiscal Year (FY) 2000, 56 individual streambank stabilization projects, totaling \$346,527, were constructed in 24 counties within the Illinois River Watershed. In all, over 32,774 linear feet of streambank, or more than 6.2 miles, has been stabilized to protect adjacent water bodies. Another environmentally oriented C2000 Program administered by the Department of Agriculture is the Sustainable Agriculture Grant Program. Grants are made available to agencies, institutions, and individuals for conducting research, demonstration, or education programs or projects related to profitable and environmentally safe agriculture. In FY 2000, over \$162,000 was awarded to six grant recipients with programs or projects in the Illinois River Watershed to investigate such areas as alternative crops, nitrogen rate studies, and residue management.

(6) *Illinois Environmental Protection Agency (EPA).* Through programs such as Section 319 (Non-Point Source Grant Program) of the Clean Water Act, the Illinois EPA has completed over 130 projects to reduce non-point source pollutants to Illinois waters since 1990, and over 35 projects are

ongoing. Projects include watershed planning, installation of Best Management Practices, development of educational materials, and CREP assistance.

**6. PLAN FORMULATION.** Plan formulation is an iterative process of problem identification, existing and future condition analysis, and project alternative formulation, evaluation, and selection. The goal of plan formulation for Illinois River Basin Restoration is to present a framework to develop and implement a Comprehensive Plan, Critical Restoration Projects, and long-term resource monitoring for the system. The plan will consider ecosystem restoration, ecological monitoring, water quality, transportation needs, and economic opportunity for business and agriculture, with an emphasis on understanding and improving environmental conditions throughout the basin.

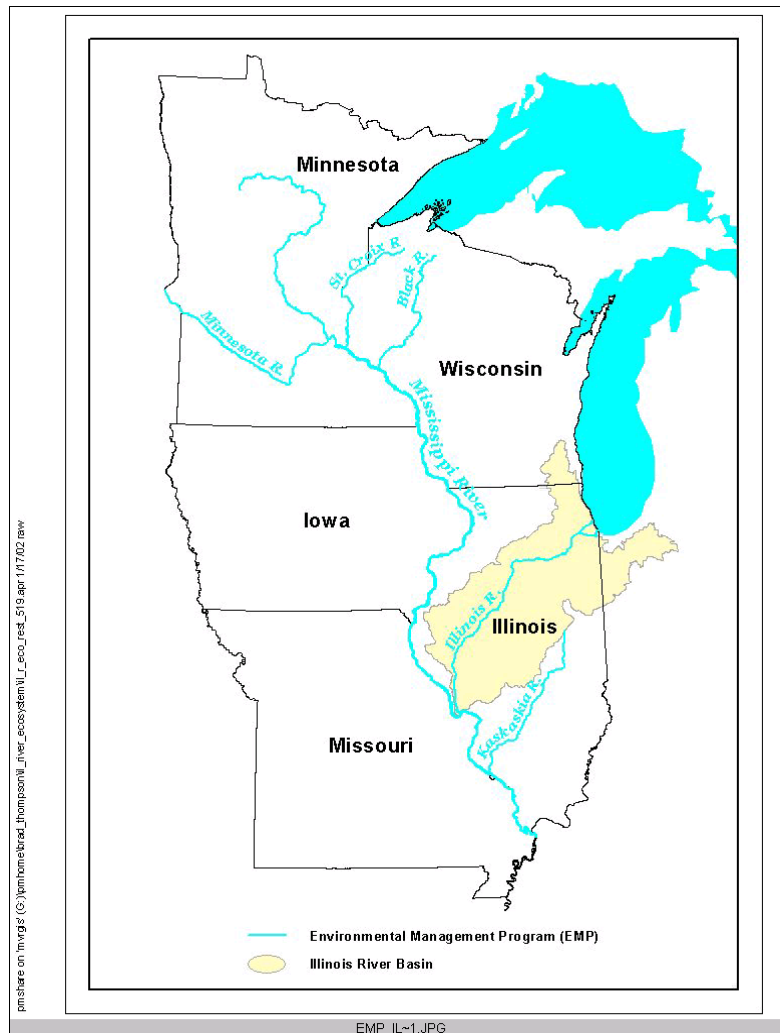
Significant interest and multiple ongoing efforts in the basin provide opportunities for considerable synergies. A number of Federal, State and local agencies, academic institutions, and citizens' groups have expressed interest in river restoration and this Initial Assessment. Because of various ongoing efforts, the Corps of Engineers has conducted numerous site visits to the study area to meet with local representatives, identify problems and needs, and evaluate potential actions for evaluation in the Initial Assessment. This section highlights the Illinois River Ecosystem Restoration, Upper Mississippi River-Environmental Management Program, and the Upper Mississippi River-Illinois Waterway System Navigation Study and clarifies the relationships and opportunities for coordination. While these efforts relate and address some Illinois River issues, considerable work remains to be completed under Section 519.

The Illinois River Ecosystem Restoration Feasibility Study was initiated in 2000 to evaluate the need for and to plan restoration. The schedule and work products are consistent with the needs identified in the Implementation Guidance for Section 519 of WRDA 2000 – Illinois River Basin Restoration. Six site-specific projects recommended by the Illinois Department of Natural Resources are under preliminary investigation as part of the Illinois River Basin Ecosystem Restoration Feasibility Study. These restoration projects are consistent with the requirements in the Section 519(c) Critical Restoration Projects. The Illinois River Ecosystem Restoration Feasibility Study – RNA work referenced in Section 5 above matches closely with the elements identified in Section 519 subsection (b) entitled COMPREHENSIVE PLAN. The RNA aspect of the study was designed to: evaluate existing data availability; compile existing data in a Geographic Information Systems (GIS) application; describe physiographic characteristics of the basin; evaluate stream channel dynamics; evaluate rapid watershed assessment techniques; evaluate existing, predicted, and desired future conditions; and compile a list of information needs. The RNA will provide information that significantly contributes to the development of the Illinois River Basin Restoration Comprehensive Plan and monitoring program.

To be most efficient, the ongoing Illinois River Basin Ecosystem Restoration Feasibility Study will provide the majority of the Comprehensive Plan required in Section 519. As a result, efforts under Section 519 will focus primarily on the remaining Comprehensive Plan requirements, Critical Restoration Projects, and system monitoring. In addition, the six site-specific projects will be continued as Critical Restoration Projects and implemented under Section 519 authority. Due to the similar focus and sponsorship, the organizational structure established for the Illinois River Basin Ecosystem Restoration Feasibility Study, described in Section 7 of this document, will be used to manage Section 519.

The Environmental Management Program, initiated in 1986, conducts habitat restoration and ecological monitoring on the mainstem Illinois and Mississippi Rivers. Five HREPs have been constructed to date on Illinois River backwater lakes. Long-term resource monitoring data on water quality, fisheries, macro-invertebrates, aquatic vegetation, and terrestrial vegetation have been collected for the La Grange Pool over a number of years. This information is being used to assess conditions in the lower reach of the Illinois River mainstem. Construction methodology, environmental monitoring, and project planning

experience gained through the Environmental Management Program will benefit Illinois River Basin Restoration activities on the mainstem Illinois River. Section 519 authority will allow restoration and monitoring to expand beyond the mainstem floodplain into the entire basin and its tributaries, as shown on the map below. This expanded effort will allow efforts to more thoroughly address system needs throughout the basin, such as sediment transport and habitat connectivity.



The Upper Mississippi River-Illinois Waterway System Navigation Feasibility Study will assist in satisfying navigation system needs requirements of the Section 519 legislation. The Navigation Study, initiated in 1992, was established to consider potential navigation system improvements in light of increasing congestion at locks and anticipated future increases in commercial navigation traffic. The study considers alternatives at locks along the Illinois Waterway. The study was restructured in 2001 to emphasize environmental sustainability. Sustainability is defined as the balance of economic, ecological, and social conditions to meet the current, projected, and future needs of the Upper Mississippi River System without compromising the ability of future generations to meet their needs. The restructured study will investigate opportunities to avoid and minimize environmental impacts of the navigation system by considering ways to coordinate ecosystem needs with navigation system operation and maintenance activities. Illinois River Basin Restoration will coordinate with the navigation aspects

of the program to satisfy those requirements, but it will also benefit from the increased attention to the environmental sustainability aspects of the study.

In addition to the Federal actions listed above, coordination with other ongoing significant activities will assist the study in meeting restoration needs. Other opportunities for consideration along with restoration include providing economic opportunity through ancillary benefits to hunting, fishing, boating, bird watching, improved water quality, and flood damage reduction.

a. Identified Problems. The Illinois River Basin has been the subject of numerous studies and ongoing efforts and the issues facing the basin are well documented. The following is a review of the environmental conditions within the existing system. From the existing conditions, it is possible to identify expected future conditions, problems, and opportunities.

*(1) Existing Conditions.*

*(a) General Description.* The Illinois River begins at the point where the Des Plaines and Kankakee Rivers converge near the Will and Grundy County lines. It flows 270 miles before entering the Mississippi River at Grafton, Illinois, about 40 miles north of St. Louis. The Illinois River connects to Lake Michigan through the Des Plaines River, Chicago River, and a series of canals, the whole of which constitutes the Illinois Waterway. The Illinois River Basin encompasses roughly 30,000 square miles, covering 44 percent of the land area of the State of Illinois. There are more than a dozen major tributaries to the main river. About 1,000 square miles of the watershed extend into Wisconsin and another 3,200 square miles extend into Indiana. The Illinois River Basin primarily consists of agricultural land, but its headwaters in northeastern Illinois are highly urbanized. More than 90 percent of the population of Illinois resides within the basin.

Along the upper reach of the river, from Lockport to Hennepin, the river flows southwesterly down a fairly steep incline through a narrow, young valley. At Hennepin, the river encounters the “Great Bend” where the Illinois turns southward and flows past Peoria to Beardstown in a gentle gradient through a broad, shallow valley 3 to 6 miles wide that was once occupied by the Mississippi River. The lower reaches of the river include dozens of lakes and backwaters that were originally formed by erosion and deposition processes. About 60 percent of the floodplain in the lower river is isolated from the river by levees.

The suite of environmental stresses affecting the Illinois River has gone through a series of phases. When navigation dams were first built in the river in the late 1800’s, but to a greater extent with the completion of the modern lock and dam system in 1939, many of the backwaters and wetlands were inundated. Water levels were further raised as much as 4 feet in the early 1900’s when water was diverted from Lake Michigan to dilute sewage from the City of Chicago. These higher water levels briefly increased biological production in the river, but poor water quality due to the sewage in the river soon reduced dissolved oxygen levels enough to significantly reduce benthic organism and fish survival. Extensive levee construction starting in the early 1900’s led to the isolation of more than half of the 400,000-acre floodplain and the drainage of numerous backwater lakes.

Beginning in the mid 1800’s, but accelerated through the mid 1900’s, land use changes in the basin and tributary stream channelization resulted in more powerful tributary storm flows and increased the transport of sediment from the basin. Since the 1950’s, intensive row crop agriculture, particularly soybean cultivation, has left the soil bare and vulnerable to erosion many months each year. Silt from upland soils is easily transported by river flows, and it settles in the quiescent backwater environments, filling them with flocculent sediment that is easily resuspended.

Although the incidence of poor dissolved oxygen conditions and the intensity of erosion from agricultural fields have abated from their peaks because of the implementation of wastewater treatment and improved farming practices, the restoration of the Illinois River ecosystem will require overcoming several challenges. Existing sediment within the system continues to cause turbidity, fill backwaters, and affect navigation. Excessive amounts of sediment continue to enter the river from the tributaries, some due to field erosion but in many cases due to construction activities and streams destabilized by high flows or channelization. The hydrologic regime is also significantly different from that experienced under predevelopment conditions, and the effects of urbanization continue to intensify the volatility of water levels in the river and its tributaries. Dam operations also add to the problem of volatility of river water levels. Finally, a significant portion of the floodplain in the lower portions of the river remains disconnected from the river, and the floodplain no longer receives sediment from the river or provides habitat for wildlife.

(b) Plants and Animals. The Illinois River and its backwater lakes, wetlands, and bottom-land forests provide nesting, food, and cover for fish, waterfowl, and wildlife. Today's plants and animals are but a remnant of their historic levels, but they still include some of the richest habitat in the Midwest, even some unique in North America.

(c) Vegetation. Basic to the ecology of the river valley are the plant communities that grow in, alongside, and on the floodplain. The plant life of the Illinois Valley is best understood according to its physical relationships to the river and its backwaters—aquatic vegetation grows in the waters, moist soil vegetation occurs alongside, and floodplain vegetation, mainly forest, occurs on the bottomlands away from the river. The life cycle of each is tied to the annual hydrologic cycle. Present land cover and forest diversity are much lower than in the early 1800's.

Submersed Aquatic Vegetation. Aquatic plants provide food for waterfowl and habitat for plankton, small invertebrates, and small fish. A century ago, the waters of the Illinois River Valley teemed with aquatic plants, but today only remnants of those species are found. Submersed aquatic plants are nearly absent in channels and connected backwaters, and generally only occur along the Illinois River in managed backwaters.

The disappearance of most of the submerged aquatic vegetation from the waters of the Illinois River Valley seems to be linked to pollution, sedimentation, and fluctuating water levels. However, just as important to the disappearance of submerged aquatic vegetation is the turbidity caused by excessive sediment which inhibits photosynthesis. Moreover, suspended sediments settle only loosely to the lakebeds and create soft bottoms in which aquatic plants cannot take root.

Moist Soil Vegetation. Moist soil plants can potentially grow on a maximum of 31,000 acres of mudflats occurring around the shores of backwater lakes, but in most years only a few thousand acres support abundant plants because of unfavorable water levels. Seeds from these plants are the primary food source for as many as 25 different species of waterfowl, which either feed on them directly from the plants or glean them from the mud or shallow waters after frost. The moist soil plant community is dependent on low stable summer water levels. Increased hydrologic variability since the 1950's has reduced the abundance and distribution of moist soil plants.

Floodplain Vegetation. The pre-settlement river valley was a complex mosaic of prairies, forests, and wetlands. Forests fringed lakes and channels while prairies occurred on higher elevations away from water bodies. Forest communities were diverse, with species distributed according to their flood tolerance; less tolerant species grew on well-drained natural levees and ridges, and flood-tolerant species dominated lower elevation floodplain areas. Wetlands developed in depressional areas that pooled floodwaters. Historical changes in floodplain conditions have greatly altered floodplain

vegetation communities. Increased water levels flooded out many intolerant tree species, creating a simple forest community dominated by silver maple. Fire suppression and agriculture eliminated prairies. Wetlands were flooded or degraded by sediment.

(d) Wildlife, Fish, and Waterfowl.

Wildlife. The forests, wetlands, and scrub-shrub environments of the Illinois River Valley are home to approximately 50 different species of mammals, including many species of opossums, shrews, weasels, moles, bats, rabbits, squirrels, beavers, raccoons, muskrats, minks, red and gray foxes, coyotes, and deer.

Although fewer species of mammals inhabit the forests and wetlands of the Illinois River Valley today than 100 years ago, wildlife populations in general are stable and healthy. Some species, such as raccoons and beavers, are as plentiful now as at any time in recent memory. Even white-tailed deer, which were hunted to extinction in the Illinois River Valley in the early part of this century, have thrived since their reintroduction in the 1930's.

Fish. The Illinois was once among the most biologically productive rivers in the Nation. As recently as the 1950's, the waters of the Illinois River Valley were included among the great inland commercial and sport fisheries. Although this is no longer the case, the State as a whole remains one of the Nation's top 10 producers of freshwater fish.

The Illinois River is home to more than 100 fish species, and its side channels and backwater lakes serve as nurseries and spawning areas. Carp and carp-goldfish hybrids are most abundant, but other species common to the Illinois include gizzard shad, white bass, largemouth bass, bluegill, and black crappie. Channel catfish, buffalo, bullhead, cool-water, and many other warm-water species also inhabit the river.

In the upper river, improving water quality since the 1970's has resulted in increased populations of largemouth bass and black bullheads and in the appearance of substantial numbers of white bass, especially around Starved Rock.

The middle river has historically been the most productive because of the excellent habitat in backwater lakes and wetlands along the riverbanks. However, as the lakes fill with sediment and as aquatic vegetation is lost, food resources are diminished. Levees have also reduced floodplain connectivity and limited spawning, feeding, and rearing opportunities for many fish species.

The lower river, from Beardstown to Grafton, features about the same mix of fish species as the middle river, but populations are smaller. Even though water quality is better than in the middle river, fish populations are constrained because the lower river is almost completely leveed, and very few backwater habitats or floodplains are accessible for breeding.

Waterfowl. The Illinois River Valley is a resource for hundreds of thousands of waterfowl that rest and feed among the backwaters during their spring and fall migrations. It is part of the internationally significant Mississippi Flyway, the route followed by migratory waterfowl between Canada and the Gulf Coast.

The backwater habitats of the Illinois River Valley support approximately 25 species of waterfowl, about 95 percent ducks and 5 percent geese, the most plentiful being mallards, which can at times account for more than three-quarters of the waterfowl population. The valley represents a special haven for wood ducks, which breed abundantly among the backwater lakes of the Illinois River.

Migrating waterfowl typically visit the Illinois River backwaters between 16 to 28 days each spring and fall, with an average stay of 21 days. The availability of food is the primary factor affecting the number of ducks and the length of their stay. If waterfowl do not find food soon after they arrive in the backwaters, they leave the area within one day and continue their migrations.

The loss of food resources, particularly fingernail clams in the 1950's, caused major declines among diving duck populations. With the loss of both the fingernail clams and the aquatic vegetation, many diving duck species shifted their migration path to the Mississippi River.

With the demise of their habitats and food resources in the last 40 years, many migratory waterfowl have abandoned the waters and backwaters of the Illinois. As a result, mallards now make up as much as 85 percent of the duck flight over the Illinois River Basin, probably because their feeding habits are so flexible.

To develop alternative food sources, private duck clubs and State and Federal agencies have established management areas and refuges with controlled water levels. These areas have some degree of water control to encourage mudflats on which moist soil plants can grow for dabbling ducks.

(e) Shorebirds. The backwaters of the Illinois River serve as habitat for 20 to 30 species of shorebirds and 15 species of gulls and terns. The cottonwoods and black willows along the middle and lower river and its wetlands are host to various types of herons, egrets, plovers, sandpipers, and other migrating wading shorebirds, as well as gulls and terns.

With some species traveling between the Arctic and Chile and Argentina every year, wading birds and shorebirds represent the farthest ranging visitors to the Illinois River Valley. The river valley provides some of the best habitat for them in the Midwest. Although their numbers appear to be stable or even improving slightly, the populations of wading shorebirds have never been large.

(f) Benthic Organisms. According to studies conducted between 1913 and 1915, a very desirable mix of clean water species once dominated the benthic life forms of the river. But much of the diversity of the benthic species in the Illinois River has been diminished so that only the hardiest species still survive. The fingernail clam is the most important benthic species to have disappeared; this primary food source for bottom-feeding fish and diving ducks was plentiful throughout the river and its bottom-land lakes until 1954, when the clams abruptly disappeared. Today only isolated populations can be found in tributaries and backwater lakes. Many attempts have been made to recolonize the river with fingernail clams, but none have proved successful.

(g) Sedimentation. Excessive sedimentation is the greatest challenge affecting the Illinois River system. Sedimentation affects the navigability of the river, and sediment is filling backwater lakes at an excessive rate. By making waters turbid and murky, suspended sediments inhibit the photosynthesis of aquatic vegetation. As sediments settle out of suspension, they create a soft riverbed and lakebeds in which aquatic vegetation cannot take root.

Progress has been made to reduce erosion from agricultural lands, but they still remain a significant source of sediment to the river. Between 1982 and 1987, soil conservation practices reduced soil erosion in Illinois from about 7 tons per acre per year to about 5 tons per acre, and Federal and State agencies are actively promoting several erosion reduction programs and practices in an effort to further reduce these rates. Most of the small tributary streams of Illinois have been channelized and straightened to provide flood control, to accommodate roads and bridges, and to conform to agricultural land use. These channels are susceptible to bank and bed erosion that provides an additional source of sediment to the river.

Rural agrarian conditions are not alone in contributing to the sedimentation of the waters of the Illinois River Basin. Sediment also originates in storm runoff from road construction sites, landscape wastes, paved urban areas, and urban construction sites where vegetation has been stripped away.

While sedimentation is a problem along the full length of the Illinois, more sediment tends to remain suspended at higher flow velocities. Thus, sediment tends to fall out in slower reaches and so excessive sedimentation is more obvious on the lower river. Sand and gravel, which are the cause of most navigation restrictions that require maintenance dredging, are generally associated with sedimentation of the navigation channel at tributary deltas. Silt, which remains suspended until much lower flow velocities occur, tends to be transported into and drops out in backwater lake areas where it can fall out of suspension. Sedimentation adversely affects the biological functions of backwaters in several ways: (1) reduces connections to the river, (2) increases turbidity and degrades water quality, (3) creates unstable lake bottoms that limit the growth of aquatic vegetation, and (4) reduces depths and converts aquatic area to terrestrial habitats.

(2) *Expected Future Conditions.* In many ways, environmental conditions within the Illinois River system have improved in the past few decades. This improvement has been largely due to changes in farming practices and national and regional efforts to meet the goals of the Clean Water Act. It is expected that water quality will continue to improve in the future because of improved waste and storm water treatment practices and local conservation efforts, and that improved water quality will translate into improvements in other ecosystem components. For example, fish and freshwater mussel populations in the main river channel have recently shown improvements that can be attributed to better water quality.

Improvements in water quality, however, have not resulted in recovery of all aspects of the river system. Due to several factors including the combination of water level fluctuations and increased sedimentation and turbidity, aquatic vegetation has not returned to the Illinois River. Water level fluctuations also continue to negatively affect emergent aquatic plants. Excessive amounts of sediment continue to fill backwater and side channel habitats, and fish and aquatic populations have not improved as markedly in these areas as they have in the mainstem of the river. Resources for migratory waterfowl will continue to be destroyed by a combination of problems, including sedimentation, water level fluctuations, urbanization, and industrial, agricultural, and domestic pollution.

Continued improvement in chemical water quality will be insufficient to prevent further degradation of many aspects of the Illinois River ecosystem. Without further reduction of sediment entering the system from degraded tributaries and management of sediment already within the system, backwater areas will continue to rapidly fill and aquatic vegetation beds will not recover. A more subdued hydrologic regime will be necessary to allow moist soil vegetation to return. In-channel, floodplain, and tributary habitats that have been removed or disconnected from the system will have to be reintroduced to restore appropriate system functions. Without a number of coordinated restoration efforts, many ecological functions of the Illinois River system, such as its support of backwater fisheries and waterfowl, will continue to decline.

(3) *Problems and Opportunities.* The principal habitat problems in the Illinois River Basin are the result of sedimentation of backwaters and side channels, degradation of tributary streams, water level fluctuations, loss of floodplain and tributary connectivity, and other adverse impacts caused by human activities. The principal focus for this assessment was identifying further Comprehensive Plan tasks and developing a framework for the identification and evaluation of Critical Restoration Projects and resource monitoring measures. A restoration vision was developed for the Illinois River as part of the development of the State of Illinois Lt. Governor's *Integrated Management Plan for the Illinois River Watershed*. This plan was prepared by the Illinois River Strategy Team with input from nearly 150 participants. The vision of this plan was for:



A naturally diverse and productive Illinois River Basin that is sustainable by natural ecological processes and managed to provide for compatible social and economic activities.

With the *Integrated Management Plan* providing context, emphasis will be given to projects that address the following system goals developed during the Illinois River Ecosystem Restoration Study:

- (a) Reduce sediment delivery from upland areas and tributaries to the Illinois River,
- (b) Selectively remove sediment, reduce sediment deposition, and improve sediment characteristics in backwaters and side channels,
- (c) Restore floodplain habitat and function,
- (d) Increase connectivity of aquatic and terrestrial habitats,
- (e) Naturalize hydrologic regimes in tributaries and the mainstem Illinois River,
- (f) Restore natural disturbance regimes,
- (g) Protect high quality and restore degraded native ecosystems and habitats,
- (h) Maintain viable populations of native species, and
- (i) Improve water quality.

b. Alternative Plans and Actions Considered. The restoration of the Illinois River Basin must be a collaborative effort with a number of Federal, State, and local stakeholders who are concerned about or charged with the protection and restoration of the Illinois River. Systematic restoration of the Illinois River Ecosystem will require a combination of comprehensive planning, well-targeted restoration projects, and ongoing system assessment through monitoring.

(1) Comprehensive Plan. Development of a Comprehensive Plan is called for in Section 519 of WRDA 2000. The Comprehensive Plan will be developed using information from the complementary Illinois River Ecosystem Restoration Feasibility Study and Illinois River Basin Restoration Section 519 efforts. This section describes the major investigations being undertaken through these efforts, assumptions and exceptions, planning constraints and objectives, and schedule, milestones, and cost.

The purpose of the Comprehensive Plan is to meet Federal planning requirements and congressional authority in identifying restoration needs within the basin. The Illinois River Ecosystem Restoration Feasibility Study effort will identify problems and opportunities, define existing and future without conditions in the Basin, develop a consensus-based desired future condition and restoration need, document resource significance, formulate at the system level to determine Federal interest and level of effort required, and develop a restoration program and prioritization process. In addition, Section 519 funding will be used to address Comprehensive Plan requirements from that legislation including: (1) the development and implementation of a program for sediment removal technology, sediment characterization, sediment transport, and beneficial uses of sediment; (2) the development and implementation of a program for the planning, conservation, evaluation, and construction of measures for fish and wildlife habitat conservation and rehabilitation, and stabilization and enhancement of land and water resources in the basin; (3) the development and implementation of a long-term resource monitoring program; (4) the development and implementation of a computerized inventory and analysis system;

(5) summarization of Illinois River transportation and economic information; and (6) improvement in planning tools for watershed assessments, characterizing ecosystem project benefits restoration techniques. The study area is the entire basin. However, study and restoration initiatives will likely focus on the rivers, streams, floodplain, and adjacent riparian corridors.

The following descriptions detail the major study investigations being conducted under the Illinois River Ecosystem Restoration Study and Illinois River Basin Restoration (Section 519) efforts, respectively.

#### Illinois River Ecosystem Restoration Study Major Investigations.

- Develop Goals and Objectives. System level goals have been developed under the Ecosystem Study and are presented under the Problems and Opportunities section of this assessment. Objectives will be further defined through ongoing study efforts.
- System Restoration Needs Assessment (RNA). The RNA aspect of the study was designed to evaluate existing data availability; compile existing data in a Geographic Information Systems (GIS) application; describe physiographic characteristics of the basin; evaluate stream channel dynamics; evaluate rapid watershed assessment techniques; evaluate existing, predicted, and desired future conditions; and compile a list of information needs. The RNA will provide information that significantly contributes to the development of the Illinois River Basin Restoration Comprehensive Plan and monitoring program and aides in the selection of future Critical Restoration Projects.
- Hydrologic Investigations. Several investigations are ongoing, including:
  - *Water Level Management Analysis.* In order to address the concerns with rapid water level fluctuations, an evaluation is being conducted to investigate potential refinements in management related to operation of Corps of Engineers dams, Greater Chicago Metropolitan Water Reclamation District (MWRD), Lake Michigan Diversions, and tributary streams. This analysis is focused on identifying opportunities to more closely replicate the natural hydrologic regime. In addition, opportunities for pool drawdowns will be explored for two pools.
  - *Floodplain Restoration and Protection Analysis.* To address potential floodplain restoration, an evaluation will be conducted of floodplain management options, including increased management, removal, setback, or potential acquisition of some leveed areas.
  - *Basin Model.* A calibrated and verified hydrologic model of the watershed is being developed. The model should be able to estimate the consequences on water levels of actions taken within the watershed. The model will consist of two levels—a coarse grid model for the entire watershed and a fine grid model for some specific and selected watershed(s).
- System NEPA and Coordination. National Environmental Policy Act (NEPA) documentation and required coordination will occur in a Programmatic Environmental Impact Statement as part of the Ecosystem Study efforts.
- Site-Specific Projects. Several site-specific investigations were initiated under the Ecosystem Study. These projects are consistent with requirements for Critical Restoration Projects and are proposed to be the first Critical Restoration Projects implemented under Section 519.

## Illinois River Basin Restoration System Major Investigations.

- Development and implementation of a program for sediment removal technology, sediment characterization, sediment transport, and beneficial uses of sediment. This task will focus on review, evaluation, and determination of applicability for existing sediment removal technology, sediment characterization, sediment transport, and beneficial use of sediment within the Illinois River Basin. Field demonstrations of innovative sediment removal methods and technologies will be pursued where appropriate. The product of this task will be a concise summary of the various sediment removal, transport, and beneficial use options, their advantages and disadvantages, approximate costs, and appropriate application recommendations for the Basin.
- Development and implementation of a program for the planning, conservation, evaluation, and construction of measures for fish and wildlife habitat conservation and rehabilitation, and stabilization and enhancement of land and water resources in the basin. The development of this program will be the major outcome of the plan formulation efforts of both these study efforts. Based on system level understanding gained through the various information gathering and analysis tasks, a program will be developed. The process detailed in Section 7 of this report will be used and further developed in the Comprehensive Plan to identify, evaluate, prioritize, and implement Critical Restoration Projects and any other future system restoration work.
- Development and implementation of a long-term resource monitoring program. A panel of regional experts on the Illinois River Basin will convene to determine the ecosystem functions that drive the system and then assess the physical and ecological parameters that best reflect each of these functions. These parameters will provide the basis for analyzing the state of the system as a whole and as such define the monitoring needs. The panel will also make recommendations regarding system biological and physical monitoring as well as site-specific pre- and post-project monitoring. A program for long-term resource monitoring of the basin will be documented along with recommendations for implementation. The activities recommended to be part of the program will help to better understand the system, identify changes, and provide a measure by which the cumulative effect of Critical Restoration Project implementation can be assessed. This task and the process to recommend and approve monitoring proposals are further defined in Section 7.
- Development and implementation of a computerized inventory and analysis system. An assessment will be conducted of various criteria, mediums, platform, and methods necessary for the computerized inventory, analysis, and dissemination to interested parties of information collected during the study and future monitoring activities.
- Summarization of Illinois River transportation and economic information. This task will summarize navigation structures and use, operation and maintenance activities (dredging, etc.), flood damage reduction efforts, census, and recreational use data to meet the requirements of the Section 519 legislation. These efforts are currently being addressed through two separate ongoing study efforts. The Upper Mississippi River-Illinois Waterway System Navigation Feasibility Study, initiated in 1992, was established to consider navigation system improvements. The study was restructured in 2001 to emphasize environmental sustainability and will investigate opportunities to avoid and minimize environmental impacts of the navigation system. In addition, the Upper Mississippi River Comprehensive Plan project was initiated in FY 002. This project will result in the development of a systemic, comprehensive flood damage reduction and flood protection plan for the Upper Mississippi and Illinois River floodplains. This task will

facilitate information sharing and coordination of these efforts with the Illinois River Basin Restoration effort by looking for areas of joint benefit and interest.

- Improvement in planning tools for watershed assessments, characterizing ecosystem project benefits restoration techniques. In order to adequately assess the conditions of the Illinois River Basin, a number of tasks must be undertaken to improve the understanding of the condition of the system and the analysis techniques available. The tasks in this section focus on improving the tools available to analyze the basin and Critical Restoration Projects. The results of these tasks will help streamline the process of identifying problems, solutions, and their benefits.

Assumptions and Exceptions. Feasibility Phase Assumptions: The following assumptions will provide a basis for development of the Comprehensive Plan:

- The without-project condition of the Illinois River Basin will include continued sedimentation of backwaters and side channels, degradation of tributary streams, water level fluctuations, loss of floodplain and tributary connectivity, and other adverse impacts caused by human activities.
- The Comprehensive Plan will be developed using information from the complementary Illinois River Ecosystem Restoration Feasibility Study and additional Illinois River Basin Restoration Section 519 efforts described in this document. Illinois River Ecosystem Restoration Study efforts will meet NEPA, USFWS (U.S. Fish and Wildlife Service) coordination, programmatic cultural compliance, etc. for system investigations. A separate feasibility level report will be prepared for each Critical Restoration Project. These documents will provide the basis for individual project approvals and will address Federal and State environmental and cultural requirements.
- The Comprehensive Plan will develop recommendations consistent with the Upper Mississippi River-Illinois Waterway System Navigation Feasibility Study and the Upper Mississippi River Comprehensive Plan projects, but will not duplicate efforts and investigations regarding transportation and flood protection needs.
- Policy Exceptions and Streamlining Initiatives. The study will be conducted in accordance with the Principles and Guidelines and Corps of Engineers regulations. Exceptions to established guidance have not been identified in this Initial Assessment, except a request for delegation of approval authority for Critical Restoration Projects to the Mississippi Valley Division.

Constraints. The following constraints have been identified in the Initial Assessment. The potential exists for additional constraints to be identified as analyses are conducted to complete the Comprehensive Plan.

- No impacts on flood elevations as required by Illinois law – Illinois state law specifies that any action in the floodplain that increases flood heights is not allowable or must be accompanied by mitigation of adverse effects. Due to the potential high cost associated with these actions, efforts will be made to avoid this threshold.
- No significant adverse impact on navigation channel flows – The Corps of Engineers currently operates and maintains the 9-Foot Channel Navigation Project on the Illinois Waterway. The project should avoid changes that would result in the potential for increased sedimentation in the main channel or require increased main channel maintenance dredging.

- Sponsor limitations – These include funding, land ownership or ability to acquire, and desire for limited operation and maintenance. As the Non-Federal Sponsor, the ability of the State of Illinois to afford various features or acquire the lands, easements and rights-of-way represented potential limiting factors. At this time, a final legal determination has not been made as to ownership of submerged lands in the Illinois River Basin. In addition, the sponsor desires more natural and sustainable alternatives, which avoid high operation and maintenance costs.
- Legal compliance – Due to the geographic size, scope, and purpose of this study, multiple levels of legal authority apply to the project area. All efforts conducted in the development of the Comprehensive Plan shall comply with all Federal, State, and local regulations pertaining to the activities undertaken by the Corps of Engineers and the non-Federal sponsor in this study.

Objectives. Several planning objectives of the Comprehensive Plan were identified in the Illinois River Ecosystem Restoration Study (*Problems and Opportunities*). Additional objectives were identified as part of this effort. These include, but are not limited to, the following:

- Assess the overall restoration needs and develop a consensus-based desired future condition of the Illinois River Watershed.
- Address restoration of ecosystem function, structure, and dynamic processes to the nationally recognized Illinois River system. Help restore a naturalistic, functioning, and self-regulating system and protect critical resources from further degradation.
- Develop Critical Restoration Projects in the context of broader system/ecosystem or watershed level. Consider the interrelationships of plant and animal communities and their habitats in a larger ecosystem context (health, productivity, and biological diversity).
- Incorporate an adaptive management approach to restoration efforts considering the interconnectedness of water and land, dynamic nature of the economy and environment, and need for flexibility in the formulation and evaluation process.
- Develop watershed or sub-watershed management plans identifying the combination of recommended actions to be undertaken by various potential stakeholders.
- Collaborate in partnership with other governmental agencies, organizations, and the private sector.
- Produce benefits consistent with the North American Waterfowl Management Plan, Clean Water Action Plan, Mississippi River/Gulf of Mexico Watershed Nutrient Task Force, and Brownfields Cleanup and Redevelopment Initiative.
- Provide ancillary recreational benefits.
- Meet requirements established in Section 519 of the WRDA 2000.

Components of the Recommended Plan. The recommended plan will define the overall restoration needs of the basin and the consensus-based desired future conditions. These desired future conditions are anticipated to be expressed in the form of acres of wetlands to restored, stream miles stabilized, reduced delivery of tons of sediment, percent reduction in water level fluctuations, fish passage at some number of dams, etc. The evaluations will also estimate the associated benefits at the system level such as habitat

units created, stream miles of connectivity, tons of sediment reduced, and other measures; however, the primary evaluation will be at the Critical Restoration Project level. The estimated cost of basin restoration activities will be defined as part of the Comprehensive Plan, but is likely to approach the \$2.5 billion estimated by the State of Illinois in its Illinois Rivers 2020 initiative. In addition, the Comprehensive Plan will be conducted in coordination with the Upper Mississippi River-Illinois Waterway System Navigation Feasibility Study and the Upper Mississippi River Comprehensive Plan projects, but will not duplicate efforts. Potential areas of common recommendations and interest include improved water level management, possible benefits of tributary restoration to reduce navigation maintenance dredging, and opportunities for floodplain restoration in combination with updates to system flood protection.

Schedule, Milestones, and Costs. In general, the schedule accounts for the completion of two documents described below. These documents will be developed based on the combined information provided by the Illinois River Ecosystem Restoration Study and Illinois River Basin Restoration efforts. Additional, milestones for these efforts and cost estimates are included under the project milestones and project cost sections, respectively. The Comprehensive Plan requirements will be met through the two submittals discussed below. Other summary reports will be completed to document any efforts finalized after the drafting of the Fall 2003 Comprehensive Plan document.

- A Report to Congress will be prepared and submitted to Corps of Engineers' Headquarters for processing to Congress in July/August 2002. The document will meet Congressional Requirements in Section 519 for a report within 2 years of enactment with available data from both study efforts. This document will highlight the significance of the Illinois River, Goals and Objectives, Restoration Needs (general level), status and schedule to complete Comprehensive Plan, immediate actions and long-term needs including Critical Restoration Projects and monitoring, and recommendations.
- The Comprehensive Plan for the Illinois River will be completed by the fall of 2003. It will draw on information from both the ongoing Illinois River Ecosystem Restoration Study and additional efforts undertaken through Illinois River Basin Restoration (Section 519). This document will provide the overall comprehensive plan for the Illinois River Basin, including system needs and recommendations addressing the need for and direction of a continued restoration program, long-term resource monitoring, computerized inventory and analysis system, and findings from the other study investigations.

(2) Critical Restoration Projects. Restoration of the Illinois River Basin requires the identification and implementation of projects, within the watershed and along the course of the river that repair past and ongoing ecological damage so that a more highly functioning, self-regulating ecosystem can develop within the existing basin context. Critical Restoration Projects will produce immediate habitat and sediment reduction benefits; will help evaluate the effectiveness of various restoration methods before application system wide; and make best use of the current strong local and State interest in ecosystem restoration within the basin. The Corps of Engineers will implement these Critical Restoration Projects in collaboration with the non-Federal sponsor and other Federal and local agencies. Several types of potential projects to be addressed in this assessment are listed below. Many of these restoration projects have been identified as needs in numerous prior studies and evaluations, but have not been addressed to date due to a lack of programs and funding. It should be noted that any restoration involving private lands would be conducted on a voluntary basis.

- Stabilize unstable streams in rural and urban areas, particularly streams where the rate or magnitude of erosion yields abrupt or progressive changes in location, gradient, or pattern of natural or human-induced changes.
  - Implement grade control on tributary streams where downcutting is occurring.
  - Implement streambank and/or streambed stabilization practices.
  - Selective de-channelization of tributaries.
  - Implement sediment collection and removal.
- Reduce the effects of excessive sedimentation in the river and its associated water bodies.
  - Restore backwater lake and side channel habitats through dredging and sediment management measures.
  - Investigate beneficial use of sediments through options for use of dredged materials.
  - Assess the feasibility of implementing temporary pool drawdowns to consolidate flocculent sediment and promote moist soil plant reestablishment.
- Naturalize river and tributary hydrology.
  - Build wetlands and other water retention capacity in urban and rural areas in the Illinois River Basin.
  - Implement alternative navigation dam operation to reduce rapid fluctuations along the Illinois River mainstem.
  - Encourage storm water management activities to minimize fluctuations to river water levels.
- Restore connections between system ecological elements.
  - Restore and maintain connections between backwaters and the channel.
  - Realign, setback, remove, or alter operation of selected levees to restore floodplain inundation.
  - Restore stream connectivity through selected fish passage structures or dam removal.
  - Remove channel flow obstructions.
  - Restore riverine habitat.
  - Build islands to increase habitat diversity.
  - Open or close selected side channel openings as appropriate to restore or maintain the flow of water to these channels and associated backwaters.
  - Develop aeration and water control systems to improve habitat quality.
- Restore riparian and floodplain biological function.
  - Develop moist soil management units in selected areas.
  - In conjunction with other restoration practices, using native plants to the extent possible, implement or establish filter strips, vegetation plantings, riparian forest buffers, mast tree planting, tree planting, upland wildlife habitat management, and timber stand improvements.

Feasibility level investigations for six site-specific projects were initiated under the Illinois River Ecosystem Restoration Study. These six projects will produce independent, immediate, and substantial restoration, preservation, and protection benefits and will be completed and implemented as the initial Critical Restoration Projects of the Illinois River Basin Restoration Project. Following is a description of the six Critical Restoration Projects, preliminary cost estimates, benefits, and the relationship of the project to the goals and objectives of the basin study.

(a) Waubonsie Creek. Waubonsie Creek is located in northeastern Illinois. The creek has a number of low-head dams that prevent movement of fish from the Fox River into approximately 7 miles of potential spawning and nursery habitat in Waubonsie Creek. The project will create approximately 11 acres of wetland habitat and enhance existing wetlands. The project will restore fish access to quality spawning habitat, allow fish recolonization of the creek following high flow, restore riparian wetlands, improve aquatic habitat, and provide off-channel refuge for fish during high flow events. Total project costs are estimated at \$3 million. This effort is consistent with system goals of increasing connectivity of aquatic habitats, restoring degraded habitats, restoring floodplain habitat, and maintaining viable populations of native species. The expected benefits clearly outweigh the investment cost.

(b) Pekin Lake. Pekin Lake is a 1,200-acre backwater lake complex located adjacent to the Illinois River at River Miles (RM) 153-156 of the Illinois Waterway. Sedimentation and water level fluctuations have degraded the aquatic resources. The backwater complex currently provides no overwintering fish habitat and sedimentation, and willow invasion is projected to significantly reduce aquatic and wetland plant production. The project will restore deep off-channel habitat in a 40-acre backwater lake and enhance the productivity of wetland plants over a 230-acre area. The project will provide critical overwintering fish habitat, which is severely limited along the entire length of the Illinois River. The improved wetland will provide a reliable food source and critical stopover along the internationally significant Mississippi River Flyway. The project will maintain a historic heron rookery and slow the anticipated loss of the backwater lake. Total project costs are estimated at \$7 million. This effort is consistent with system goals of selectively removing sediment, increasing connectivity of aquatic habitats, restoring floodplain habitat and function, naturalizing hydrologic regimes, protecting high quality habitats, and maintaining populations of native species. The expected benefits clearly outweigh the investment cost.

(c) Iroquois River. The Iroquois River is located in eastern Illinois and western Indiana. Modifications of tributaries through ditching and straightening have increased velocities, bed and bank erosion, and the sediment load delivered to the Iroquois River and eventually the Illinois River. Once the fine sediment is mobilized, it remains suspended until much lower flow velocities occur. It is transported into the Illinois River and drops out in backwater lake areas. The sedimentation of these highly productive backwater lakes is recognized as the greatest threat to the Illinois River Ecosystem. Channel instability also negatively affects the habitat value of the tributary stream and its riparian corridor. The project will prevent delivery of an estimated 1 million tons of sediment to the Illinois River over the project life by stabilizing banks on 20 miles of the Iroquois River and stabilizing a head cut on a tributary stream. The project will maintain aquatic habitat in 10 miles of tributary stream by preventing degradation associated with upstream progression of channel incision. Stream stabilization structures will be designed to provide instream habitat. Total project costs are estimated at \$5 million. This effort is consistent with system goals of reducing sediment delivery of tributaries, increasing connectivity of aquatic habitats, and restoring degraded habitats. The expected benefits clearly outweigh the investment cost.

(d) McKee Creek. McKee Creek is located in west-central Illinois. Modifications of McKee Creek and its tributaries through ditching and straightening have increased velocities, bed and bank erosion, and the sediment load delivered directly to the Lower Illinois River. The stream has incised channels and high rates of lateral migration. The lower 30-mile reach erodes an estimated 100,000 tons of bank material per year. The project will prevent delivery of an estimated 2.5 million tons of sediment to the Illinois River over the project life by stabilizing head cuts on the lower 10 miles of McKee Creek. The project will maintain and improve aquatic habitat in over 30 miles of stream by preventing degradation associated with upstream progression of channel incision, widening, and bank collapse. Stream stabilization structures will be designed to provide instream habitat. Total project costs are estimated at \$5 million. This effort is consistent with system goals of reducing sediment delivery,



reducing sediment deposition, and improving water quality. The expected benefits clearly outweigh the investment cost.

(e) Blackberry Creek. Blackberry Creek is located in northeastern Illinois. Currently, the stream has high quality habitats, but a 10-foot dam near the confluence with the Fox River severely limits fish and macroinvertebrate access to this habitat. The project will restore fish passage at the Blackberry Creek Dam at an estimated total cost of \$1.5 million. The project will restore access to 30 miles of quality stream habitat and allow fish recolonization of the creek following high flow events. This effort is consistent with system goals of increasing connectivity of aquatic habitats and maintaining viable populations of native species. The expected benefits clearly outweigh the investment cost.

(f) Kankakee River-Mainstem. The Kankakee River is a high quality river located in northeastern Illinois and northwestern Indiana. The Kankakee River carries an excessive sediment load, and habitat quality in the river is expected to decline due to sedimentation. Side channel and pool areas in this reach are expected to continue to lose depth and habitat diversity as cobble and gravel substrates become covered by sand. The project will restore 25 acres of deep water habitats along 30 miles of the Kankakee River. This will restore and maintain deep water habitat critical to many state protected species. Total project costs are estimated at \$1.5 million. This effort is consistent with system goals of reducing sediment deposition, protecting and restoring high quality habitats, and maintaining populations of native species. The expected benefits clearly outweigh the investment cost.

(3) Long Term Resource Monitoring. Some ongoing system monitoring is necessary to regularly assess the state and restoration needs of the system as the project continues. Some ecosystem components, such as water quality, already have monitoring programs and databases to evaluate conditions over time and space. Many other ecosystem components, such as wildlife, have smaller, targeted monitoring programs to evaluate conditions in small areas. Many ecosystem components or functions are not monitored at all. Selected monitoring parameters need to measure the relevant aspects of the ecosystem components identified in the basin-wide goals above. Specifically, additional information is needed on sediment transport, watershed connectivity, and basin hydrology. The results of this monitoring will feed back into the prioritization process at all levels to aid in the identification of Critical Restoration Projects. Data collected under this effort will extend information beyond that collected for the mainstem of the river under the Environmental Management Program-LTRMP to the entire watershed.

The need to implement additional resource monitoring measures is outlined above in (3) *Problems and Opportunities*. The most comprehensive databases currently available are for waterfowl in mainstem wildlife management areas, mainstem Illinois River fishes, aquatic invertebrates, and water quality in some, but certainly not most, streams and lakes. Sediment and stream gaging station networks were recently scaled back, resulting in relatively few sediment and discharge estimates for large portions of the watershed. Except for routine volunteer surveys such as the Christmas bird count and the breeding bird survey, most bird species are not monitored. Land cover throughout the watershed has been characterized by remote sensing (LANDSAT) imagery, but forest, wetland, and grassland species composition data are difficult to find. Potential resource monitoring measures and their value to address these deficiencies could include, but are not limited to, the following:

<b>Monitoring Measures</b>	<b>Explanation/Value to Ecosystem Understanding</b>
Data collection for ecosystem indicators or biological assessment criteria	Monitors selected ecosystem criteria to evaluate the state of the system over time
Tributary and mainstem sediment gage network	Quantifies sediment movement through the tributaries, delivery to the mainstem, and movement of sediment within the mainstem
Stream flow gaging of smaller tributaries	Characterizes nature and change in hydrologic regimes of basin headwaters
Reevaluation of changing land use patterns	Periodic update to quantify large-scale landscape changes and evaluate potential changes in ecosystem functions
Pre-project and post-project site-specific restoration monitoring	Monitor and collect key information to assist in planning, design, and evaluation of restoration project success

Any monitoring initiative will be coordinated with other existing and proposed State, Federal, and local monitoring efforts to maximize the amount of valid data acquired.

Three (3) additional sediment gages will be installed on the Illinois River and its tributaries to track the movement of waterborne sediment throughout the year. It will cost an estimated \$150,000 to install these gages and \$24,000 per gage per year to operate them. Additionally, three (3) flow only gages will be installed on critical tributaries that are likely to contain future critical project areas. These will cost \$80,000 to install and \$10,400 per gage per year to operate. The total costs are \$230,000 for installation and \$103,200 per year for data collection.

Gage placement will be coordinated with the Illinois Department of Natural Resources and the U.S. Geological Survey. As excessive sedimentation is one of the major sources of ecosystem degradation, quantification of the movement of sediment through the Illinois River system is critical to development of the Comprehensive Plan. The gage data will define the extent of the problem and help set goals for reduction. The data will also help to develop future projects and to monitor project performance. The current sediment gage network consists of only two gages on the mainstem and 15 other gages spread through the 24,500-square-mile basin. The sediment gages will be installed in the summer of 2002 and operate at least through completion of the Comprehensive Plan scheduled for 2004. Continued operation of these gages and development of a comprehensive network of hydrologic gages will be addressed in the Comprehensive Plan. The flow gages will be installed in the fall of 2002 and operate for a sufficient time to characterize the tributary basin conditions, as determined by the guidelines to be established in the Comprehensive Plan, but at least until the fall of 2007.

**7. PROCEDURES AND RESPONSIBILITIES.** This section outlines the overall organization of the Initial Assessment and describes additional work to accomplish the Comprehensive Plan and the procedures and responsibilities for identifying, evaluating, and prioritizing Critical Restoration Projects and long-term monitoring needs.

a. Study Organization. The identification, evaluation, and prioritization of Critical Restoration Projects and long-term monitoring needs will be conducted under the following organizational structure. The study organization is currently in place as part of the Illinois River Ecosystem Restoration Feasibility Study and will be used for this effort.

## Study Organization



(1) *Executive Committee.* The Committee will have representatives from both Corps of Engineers Divisions (Mississippi Valley Division and Lakes and River Division) and the non-Federal sponsor. The Executive Committee will be responsible for oversight of the study, overall policy direction, and implementation.

(2) *Steering Committee.* The Steering Committee will be the core interagency group responsible for conducting the Illinois River Ecosystem Restoration Feasibility Study. It will be co-chaired by the Corps of Engineers and the non-Federal sponsor, and will be composed of State and Federal agency representatives. This Committee will meet approximately every quarter to coordinate State and Federal action to ensure synergy between various agency programs. The Steering Committee will be supported by the activities and information of the Working Group and the Illinois River Technical Team.

(3) *Working Group.* The Working Group will provide study status and information on interim products to all interested Federal, State, and local agencies, as well as non-governmental organizations. The Working Group will meet quarterly or as interim products are completed. Its primary focus will be public involvement, information sharing, and dialog among all groups and interests.

(4) *Illinois River Technical Team.* The Technical Team will develop the detailed methodology necessary to conduct a comprehensive, basin-wide assessment of historic ecological change, existing conditions, predicted future conditions, and desired future conditions. Team members will be selected from four Illinois Department of Natural Resources regions, several State and Federal agencies, and academic institutions. The Technical Team will incorporate the expertise of science advisors as necessary.

(5) *Regional Teams.* Regional Teams will provide a mechanism for local resource managers—with detailed information on resource concerns—to identify and evaluate site-specific investigations that are currently underway.

b. Corps of Engineers Division of Responsibilities. The following structure is similar to that of the Environmental Management Program and is proposed as a means of defining responsibilities throughout

the Corps of Engineers in relation to Section 519 implementation. These responsibilities include, but are not limited to, the following.

(1) *Headquarters Level.* Corps of Engineers Headquarters maintains responsibility for the overall Section 519 Illinois River Basin Restoration Program, its budget, and approval authority for individual Critical Restoration Projects.

(2) *Division Level.* The Corps of Engineers' Mississippi Valley Division will be responsible for overall execution direction and management of the Section 519 Illinois River Basin Restoration Program. The management responsibilities of the Division will include the following tasks:

(a) Provide program policy review.

(b) Serve on the Executive Committee.

(c) Oversee overall program execution and review and approve all budget documents, funds allocations, and transfer of funds between districts.

(d) Pending Headquarters approval of delegated authority, approve Critical Restoration Projects and System Monitoring Projects that are estimated to cost less than \$5 million.

(e) Coordinate activities with the Lakes and Rivers Division.

(3) *Regional Level.* Based on total basin area within the district and existing responsibilities and relationships with the sponsor, the Corps of Engineers' Rock Island District will administer project management responsibilities, including the following:

(a) Serve as the Point of Contact for Illinois River Basin Restoration activities.

(b) Report the program financial execution to Division on a quarterly basis.

(c) Coordinate the activities of the Executive Committee, Steering Committee, Work Group, Illinois River Technical Team, and the Regional Teams.

(d) Coordinate, consolidate, and forward to Division, upward reporting requirements, such as budgetary information, fact sheets, and issue papers that require input from more than one District.

(e) Lead the comprehensive system study efforts.

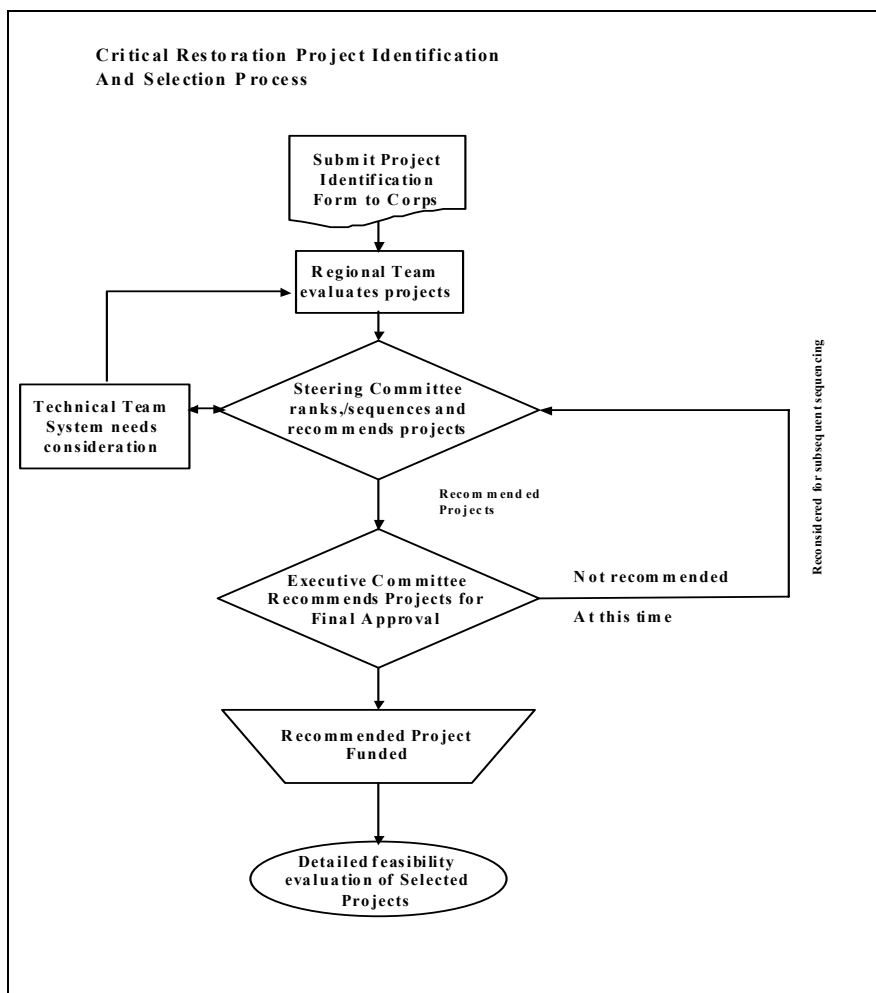
(f) Lead responsibility for system monitoring efforts.

(4) *District Level.* The responsibility for planning, design, construction, monitoring, and evaluation of Critical Restoration Projects will be assigned to the Districts (Rock Island, St. Louis, and Chicago) based on their jurisdictional boundaries. The assignments of projects that cross district boundaries will be determined by the Districts or the Executive Committee as necessary.

c. Comprehensive Plan. The Comprehensive Plan required in Section 519 will be met primarily through efforts on the Illinois River Ecosystem Restoration Study with additional efforts under Section 519. An interim report is currently scheduled for release in the summer of 2002 and will serve as the Report to Congress. The plan will address those items required in the legislation with information developed under the Illinois River Ecosystem Restoration Study.

The Feasibility Report for the ongoing Illinois River Ecosystem Study is scheduled for completion in December 2003. This report will complete the Comprehensive Plan requirements of Section 519 and finish the Feasibility Study documentation. It will provide further information more fully addressing system needs and restoration efforts beyond the Critical Restoration Projects. In addition, the other efforts addressing Section 519 requirements will also be included to adequately address plan components related to development of a long-term resource monitoring plan, review and evaluation of innovative sediment removal, characterization, and beneficial use options, summarization of Illinois River transportation and economic information, and evaluations summarizing the system needs and restoration options.

d. Critical Restoration Projects. The identification, evaluation, prioritization, and selection of further Critical Restoration Projects will be conducted in a multi-step process utilizing the teams identified in the study organization (a.) above. This process is illustrated and explained below. The six site-specific projects identified through the Illinois River Ecosystem Restoration Study should be the first Critical Restoration Projects investigated under Section 519. These efforts, meeting the proposed criteria identified below, were identified by the Illinois Department of Natural Resources through a basin-wide evaluation process, represent a range of project types addressing the major system problems, and have local interest and support.



(1) *Project Identification Process.* Projects will be initiated by agencies and individuals that will identify potential restoration projects to be considered for implementation under Section 519. Interested parties will complete a 1-page information sheet and submit it to the Regional Team, or electronically submit the information through the Rock Island District web page. Periodically, as potential projects are identified, they will be submitted to the appropriate Regional Team and the Technical Team for evaluation.

(2) *Project Evaluation Process.* Projects will be evaluated at the Regional Team level to determine if they meet the basic minimum criteria for Critical Restoration Projects. The minimum criteria are as follows:

- (a) The project produces independent, immediate, and substantial restoration, preservation, and protection benefits.
- (b) The project must be generally consistent with the Illinois River Ecosystem Restoration Study goals and objectives, the *Integrated Management Plan for the Illinois River Watershed*, and Corps of Engineers guidance.
- (c) A potential cost-sharing partner must be identified. The Corps of Engineers and the sponsor will share all project costs as specified in the PCA (Project Cost Sharing Agreement).
- (d) Total Federal project cost must be less than \$5 million (\$7.7 million total project cost at 65/35 cost share).
- (e) According to current legislation, it must be possible to implement the project before October 2004.

Projects that meet the minimum criteria will be further evaluated and prioritized by the Regional Teams. The Regional Teams and Steering Committee, to score projects based on the Corps of Engineers planning criteria, will use an evaluation and prioritization matrix. The Illinois River Technical Team will also provide input on system needs and project types to the Regional Teams. The process will be based on the following:

- *Effectiveness:* The degree to which the candidate project addresses system and sub-basin goals and objectives. This evaluation will be a qualitative estimate.
- *Efficiency:* The level of benefits provided by the candidate project will be considered. This evaluation will be a qualitative estimate.
- *Completeness:* The project must be a stand-alone project that accomplishes restoration without other outside action.
- *Acceptability:* The extent to which the project has local support, sponsor interest, is politically acceptable, and meets other factors such as visibility will be evaluated.

(3) *Project Prioritization.* The Steering Committee will prioritize the projects based on the evaluations of the Regional Teams. Projects may be grouped and prioritized by majority tributary watershed, sub-watershed, restoration practice, or other methods. The Illinois River Technical Team will

provide input on system needs and project types. The prioritized list will be submitted to the Executive Committee.

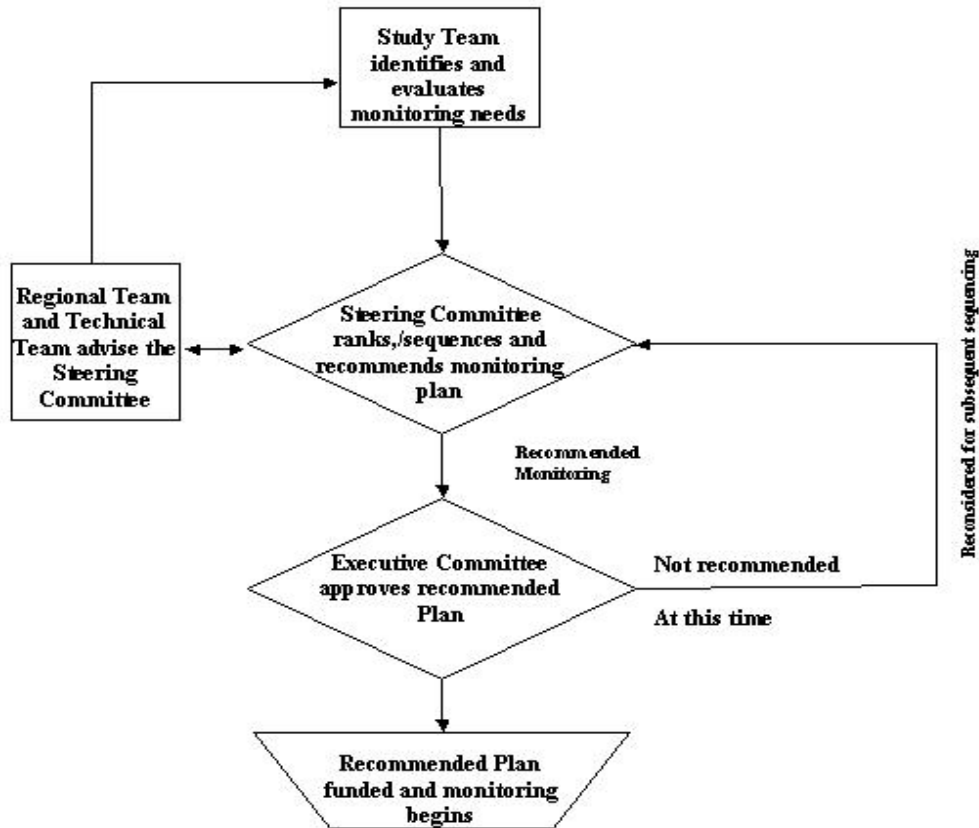
(4) *Project Selection.* The Executive Committee will select Critical Restoration Projects to recommend for approval and implementation. It is recommended that Federal approval authority to select and implement projects less than \$5 million be delegated to the Corps of Engineers' Mississippi Valley Division.

(5) *Project Evaluation.* Each Critical Restoration Project will be evaluated through a separate decision document (similar to the Environmental Management Program's Definite Project Reports). The evaluations will define benefits such as habitat units created, stream miles of connectivity, tons of sediment reduced, and other measures. Cost Effective and Incremental Cost analysis will be used to evaluate the benefits and costs of various project alternatives and to identify a recommended plan. For any recommended plan, the evaluations must show that the outputs of each project outweigh its respective costs. For initial projects, the feasibility phase will be cost shared 65/35 with the sponsor. The PCAs will be modeled after those of the Environmental Management Program and Environmental Continuing Authorities Program. It is anticipated that a model PCA will be developed for the program with the initial projects, and following Corps of Engineers' Headquarters approval, will allow delegation of PCA approval.

e. System Monitoring. Further system monitoring will follow a similar process of identification, evaluation, and prioritization as the Critical Restoration Projects (a figure is shown on the following page). Resource monitoring needs will be identified by a Monitoring Needs Study Team. The Steering Committee will prioritize, sequence, and recommend monitoring programs based on input from the Regional and Technical Teams. Monitoring will meet the goals and objectives and address areas likely to influence the need for and evaluate the success of restoration projects. Monitoring needs will be forwarded to the Executive Committee for approval. Recommended monitoring plans will be funded and monitoring will proceed in the most cost-effective way.

Immediate system monitoring needs include the collection of additional sediment, stream flow, and biological data. Additional sediment gage information is needed to better understand the number one system problem, sedimentation. Although there has been sediment gaging at 59 stations within the Illinois River Basin, 26 at the U.S. Geological Survey's (USGS) gages and 33 maintained by the Illinois State Water Survey, currently there are 15 active stations. The Illinois State Water Survey maintains 5 gages on small watersheds within the basin and gages on 8 of the major tributaries, but there are only 2 gages measuring the sediment load of the mainstem river itself. Additional mainstem and tributary gaging should be initiated immediately to further define the sedimentation problem and assist in prioritization of Critical Restoration Projects. Once the Monitoring Needs Study Team is initiated, they will develop detailed recommendations for any critical monitoring that should be initiated concurrent with the Comprehensive Plan.

### Long-term Resource Monitoring Identification And Selection Process



**8. FEDERAL INTEREST.** Ecosystem restoration projects are defined as high priority outputs in the Administration's budget policy. Within the Civil Works Program, priority is given to restoration projects that restore degraded ecosystem structure and function, including the ecosystem's hydrology and plant and animal communities, to a less degraded condition. Further, Section 519 of the Water Resources Development Act specifically identifies restoration of the Illinois River Basin and authorizes work to implement Critical Restoration Projects and develop and implement system monitoring. Federal interest in restoration at a particular critical restoration site will be defined through the evaluation process discussed in Section 7 above and incremental cost and cost-effectiveness analysis.

**9. PRELIMINARY FINANCIAL ANALYSIS.** The Illinois Department of Natural Resources has agreed to act as the non-Federal cost-sharing partner in the Initial Assessment of the Illinois River Basin Restoration. The Illinois Department of Natural Resources has indicated by a Letter of Intent, dated January 18, 2002, that it understands the feasibility and construction cost-sharing responsibilities and is willing to enter into negotiations for the feasibility phase of the investigation. The Federal share for a single restoration project is limited to \$5 million. The non-Federal cost share of projects and activities is 35 percent. The sponsor is aware that it will be responsible for all lands, easements, rights-of-way, relocations, and disposal areas of the project (LERRDs). In-kind services provided by the sponsor shall



not exceed 80 percent of the non-Federal share of the cost of the project or activity. The Secretary may credit lands and work-in-kind toward the non-Federal share regardless of the date of acquisition or project completion. The non-Federal sponsor is also aware of its responsibility for the operation, maintenance, rehabilitation and replacement of the project at 100 percent non-Federal expense. A copy of the Letter of Intent is included as Enclosure 2.

#### **10. PROJECT MILESTONES.**

Submit Initial Assessment to Mississippi Valley Division/Headquarters	January 30, 2002
Draft Project Management Plan (PMP)	March 31, 2002
Finalize PMP with Sponsor	May 15, 2002
Execute Feasibility Cost Sharing Agreement	May 30, 2002
Receive State Funds and Initiate	June 15, 2002
Interim Report to Congress	July/Aug 2002
Final Feasibility Reports on Initial Critical Restoration Projects	October 2002
Draft Comprehensive Plan	August 2003
Final Comprehensive Plan	October 2003

**11. PROJECT COST ESTIMATES.** The estimated cost for the Initial Assessment, development of the PMP, and negotiation of the Feasibility Cost Sharing Agreement is \$500,000 in Federal funds. The activities included in the agreement will be cost shared 65/35. The sponsor may provide up to 80 percent of its share with work in-kind. The total level of effort to develop the Comprehensive Plan and conduct the feasibility level evaluations for the first six Critical Restoration Projects under Section 519 funding is estimated at \$5.4 million (\$3.5 million Federal funds plus sponsor match). It is anticipated that the remainder (\$96.0 million Federal appropriation and \$51.7 million sponsor match) of the Section 519 Authority funds will be used in three areas: (1) Further System Evaluation and Understanding – 20%; (2) Critical Restoration Projects – 70%; and (3) Monitoring – 10%. However, the Comprehensive Plan will finalize the amounts and determine any further funding needs.

**12. POTENTIAL ISSUES AFFECTING INITIATION OF THE FINAL ASSESSMENT PHASE.** Consensus of the resource management agencies, the non-Federal sponsor, and the Corps of Engineers has been reached to pursue activities to restore the ecosystem of the Illinois River Basin.

**13. VIEWS OF OTHER RESOURCE AGENCIES.** Support for the assessment exists among many Federal, State, and local agencies. At present, Illinois River Ecosystem Feasibility partners include the NRCS, USGS, EPA, USFWS, and various Metropolitan Planning Organizations. In addition, numerous local communities and non-governmental organizations have supported the development of this authority and have expressed interest in the development of the assessment.

**14. PROJECT MAP.** The project area map is included as Enclosure 1.

**15. RECOMMENDATIONS.** The Illinois River Basin is a nationally significant floodplain river ecosystem and is in need of restoration. Opportunities exist for restoration and have strong support of State, Federal, local agencies, and organizations. Initial efforts should be undertaken in three areas under Section 519: (1) Comprehensive Plan, (2) Critical Restoration Projects, and (3) Long Term Resource Monitoring. The requirement for a Comprehensive Plan will be met largely through the ongoing efforts of the Illinois River Ecosystem Restoration Feasibility Study. Additional Comprehensive Plan tasks, including the development of a Long Term Resource Monitoring Plan; review and evaluation of innovative sediment removal, characterization, and beneficial use options; summarization of Illinois River transportation and economic investment; and other related evaluations summarizing system needs and restoration options not funded under the existing feasibility study effort should be funded under Section 519. The Critical Restoration Projects will initially include six ongoing investigations identified through the Illinois River Ecosystem Restoration Feasibility Study, with additional potential projects identified through the planning process presented in this document. Similarly, the Corps of Engineers should initiate long-term system monitoring tasks, which are clearly needed to improve understanding of the system's problems and needs and enhance the success of future projects.

I hereby recommend that this Initial Assessment be approved, that permission be given to develop the PMP, and that negotiation of a Cost Sharing Agreement with the State of Illinois begin.

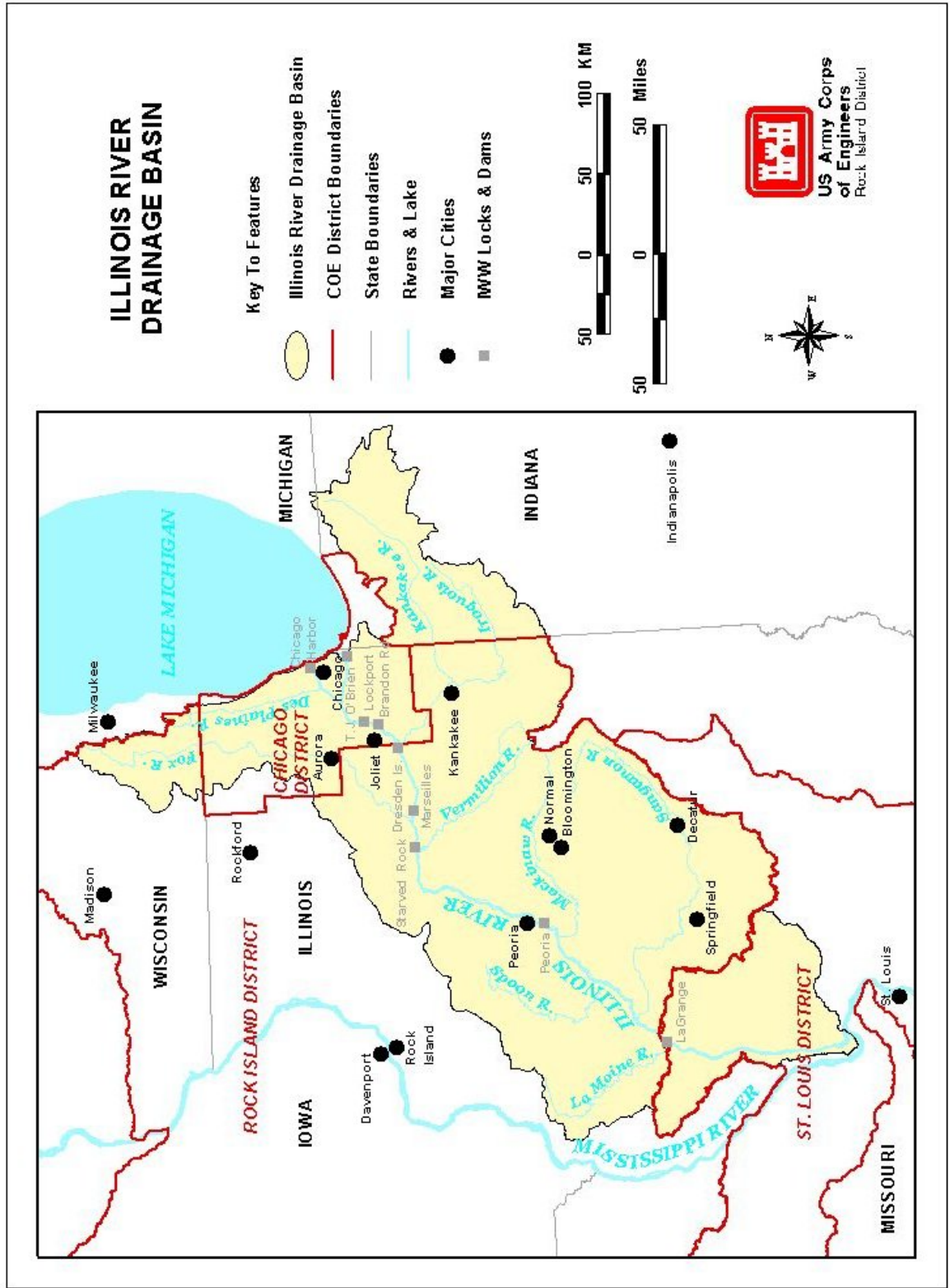
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(Date)

William J. Bayles  
Colonel, U.S. Army  
District Engineer

Enclosures

1. Project Location Map
2. Illinois Department of Natural Resources Letter of Intent





**Illinois**  
Department of  
**Natural Resources**

524 South Second Street, Springfield, Illinois 62707-1787

<http://dnr.state.il.us>

George H. Ryan, Governor • Brent Manning, Director

January 18, 2002

Colonel William Bayles  
District Engineer  
U.S. Army Engineer District, Rock Island  
ATTN: Planning Division  
P.O. Box 2004  
Rock Island, Illinois 61204-2004

Dear Colonel Bayles:

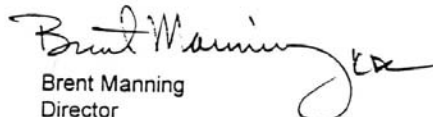
The State of Illinois, Department of Natural Resources wishes to express their support for and willingness to participate with the U.S. Army Corps of Engineers in the Illinois River Basin Restoration authorized by Section 519 of the Water Resource Development Act of 2000.

Under the Corp Section 519 (Illinois River Basin Restoration) study process, I understand that this is a multi-phase study and implementation process for ecosystem restoration and recovery. The first phase is an initial assessment and development of a Project Management Plan leading to a signed Cost Share Agreement. In subsequent phases (feasibility, design/engineering, and construction phases) non-federal cost-sharing must be provided by the State of Illinois in order to complete this Study. Should the initial assessment phase study indicate that additional studies are warranted and needed to investigate the problems and solutions in greater detail and if economically and environmentally feasible structural measures are identified, the State of Illinois, Department of Natural Resources (Department) will give serious consideration to providing all or a portion of the required nonfederal cost-share. Any funding of the required non-federal cost-share by the Department is subject to annual State appropriations.

In addition, the State of Illinois wishes to express its support for the identification of Critical Restoration Projects as provided by Section 519 and encourages the Corps to make such designations and initiate project assessment activities as soon as possible. The State of Illinois will provide the Corps with such areas of concern which should be initially considered.

We support the initiation of the Illinois River Basin Restoration Project under Section 519 and look forward to assisting the Corps of Engineers in completing its work under this authority as the non-federal sponsor.

Sincerely,

  
Brent Manning  
Director

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**Enclosure 2**